PATENT ABSTRACTS OF JAPAN

(11)Publication number : 10-147191
(43)Date of publication of application : 02.06.1998

(51)Int.Cl. B60R 13/08
B32B 5/26
D04H 1/54
D04H 11/08
E04B 1/84

(21)Application number : 08-309275
(22)Date of filing : 20.11.1996

(71)Applicant : KANEBO LTD
NISSAN MOTOR CO LTD
(72)Inventor : OKU AKISUKE
NAGAYAMA HIROKI
NEMOTO KOICHI
SUGAWARA HIROSHI

(54) BULKY RAISED NONWOVENT FABRIC FOR AUTOMOBILE INTERIOR AND MANUFACTURE THEREOF

(57)Abstract:
PROBLEM TO BE SOLVED: To provide a fabric which is excellent in a soft feeling and in a noise shielding/absorbing property by independently forming a design layer web, in which a matrix fiber made of a high melting point synthetic fiber staple is blended with a heat fusing binder fiber staple at a specific mixing ratio, and a base member layer web and laminating and integrating the both webs together.
SOLUTION: For forming a short fiber web for a nonwoven fabric design layer, 76-98% by weight of a high melting point polyester group staple fiber of 2-30 deniers as a matrix fiber and 2-24% by weight of a polyester group heat fusing stable fiber of 1-20 deniers as a heat fusing binder fiber are blended together so as to be carded. Separately, 30-95% by weight of a high melting point polyester group staple fiber of 1.5-40 deniers as a matrix fiber and 5-70% by weight of a heat fusing staple fiber of 1-20 deniers as a heat fusing binder fiber are blended together and carded so as to be formed into a short fiber web for a nonwoven fabric base member layer. Then, these short fiber webs are layered mutually so as to be integrated together.

LEGAL STATUS

[Date of request for examination] 27.06.2002
[Date of sending the examiner's decision of rejection]
[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]
[Date of final disposal for application]
[Patent number]
[Date of registration]
[Number of appeal against examiner's decision of rejection]
[Date of requesting appeal against examiner's decision of rejection]
[Date of extinction of right]

CLAIMS

[Claim(s)]

[Claim 1] The nonwoven fabric design layer which comes to form the pile which configuration fiber including one [at least] front face was colored, and continued all over the front face, and a part of configuration fiber projected, The nonwoven fabric base material layer which a laminating is carried out to this design layer in one, and has firmness enhancement and a buffer function is included. It is the nonwoven fabric with which consist of a staple fiber of a thermoplastic synthetic fiber as a whole, and this staple fiber comes to contain a matrix fiber and thermal melting arrival nature binder fiber further. The above-mentioned design layer 98 - 76 % of the weight of 2-30-denier high-melting matrix fibers, It comes to blend 2 - 24 % of the weight of 1-20-denier thermal melting arrival nature binder fiber for which a low-melt point point composition polymer occupies a fiber front face at least. The above-mentioned base material layer by which the laminating was carried out to this design layer in one 95 - 30 % of the weight of 1.5-40-denier high-melting matrix fibers, By blending 5 - 70 % of the weight of 1-20-denier thermal melting arrival nature binder fiber for which a low-melt point point composition polymer occupies a fiber front face at least, and being constituted The automatic in-the-car wearing bulky piloerection nonwoven fabric bulky piloerection nonwoven fabric with which the welding point formed in the intersection of configuration fiber by being heated at the temperature between the melting point of said matrix fiber and the melting point of said binder fiber is characterized by having the sound absorbing and insulating properties which came to be distributed over homogeneity and were substantially excellent in it.

[Claim 2] The automatic in-the-car wearing bulky piloerection nonwoven fabric according to claim 1 which has the fineness whose thermal melting arrival nature binder fiber blended with a design layer is 2-15 deniers.

[Claim 3] The automatic in-the-car wearing bulky piloerection nonwoven fabric according to claim 1 or 2 with which a design layer comes to blend 95 - 80 % of the weight of high-melting matrix fibers, and 5 - 20 % of the weight of thermal melting arrival nature binder fiber.

[Claim 4] An automatic in-the-car wearing bulky piloerection nonwoven fabric given in any 1 term of claims 1-3 with which a base material layer comes to blend 90 - 40 % of the weight of high-melting matrix fibers, and 10 - 60 % of the weight of thermal melting arrival nature binder fiber.

[Claim 5] An automatic in-the-car wearing bulky piloerection nonwoven fabric given in any 1 term of claims 1-4 said whose thermoplastic synthetic fibers are polyester fiber.

[Claim 6] An automatic in-the-car wearing bulky piloerection nonwoven fabric given in any 1 term of claims 1-5 said whose high-melting matrix fibers are gay polyester fiber substantially.

[Claim 7] An automatic in-the-car wearing bulky piloerection nonwoven fabric given in any 1 term of claims 1-6 whose low-melt point point composition polymers of said thermal melting arrival nature binder fiber which occupy a fiber front face at least are the copoly ester or blend polyester of a low-melt point point.

[Claim 8] The automatic in-the-car wearing bulky piloerection nonwoven fabric according to claim 7 which is the sheath-core mold conjugate fiber to which said thermal melting arrival nature binder fiber uses the copoly ester or blend polyester of a low-melt point point as a sheath component, and uses gay polyester as a heart component.

[Claim 9] The automatic in-the-car wearing bulky piloerection nonwoven fabric of claim 8 which has the melting point of the range said whose low-melt point point copoly ester is 100-230 degrees C.

[Claim 10] The automatic in-the-car wearing bulky piloerection nonwoven fabric with which the laminating of claim 9 which has the melting point of the range said whose low-melt point point copoly ester is 105-210 degrees C was carried out.

[Claim 11] In the condition that the laminating of said nonwoven fabric was carried out, it has the average thickness of 1-50mm after shaping, and they are average apparent density gravity 0.01 - 1.0 g/cm3. Automatic in-the-car wearing bulky piloerection nonwoven fabric given in any 1 term of claims 1-10 characterized by consisting of the fabricated fiber aggregate.

[Claim 12] It sets in the condition that the laminating of said nonwoven fabric was carried out, and they are the thickness of 5-70mm, and 300 - 2000 g/cm2. Automatic in-the-car wearing bulky piloerection nonwoven fabric given in any 1 term of claims 1-11 which have eyes.

[Claim 13] An automatic in-the-car wearing bulky piloerection nonwoven fabric given in any 1 term of claims 1-12 to which the pile of the staple fiber for design layers which consists of a colored thermoplastic synthetic fiber is formed in a front face of needle punch, and cuts a part for the point to an even length by shirring processing further.

[Claim 14] said pile point -- shirring processing -- the predetermined difference of elevation -- with, the automatic in-the-car wearing bulky piloerection nonwoven fabric of claim 13 which is cut to an even length and a code tone or the Di Roar tone comes to ****.

[Claim 15] The nonwoven fabric for design layers which consists of a colored thermoplastic synthetic fiber which has the pile projected in part, and it are the manufacture approach of the automatic in-the-car wearing bulky piloerection nonwoven fabric characterized by carrying out the laminating of the nonwoven fabric base material layer which has the firmness enhancement and the buffer function which were created by another object, and carrying out the junction unification of both needle punch and/or by carrying out heating adhesion.

[Claim 16] The staple fiber web for design layers colored from at least one set of the cross layer which contains the object for outermost layer web supply, using two or more cross layers continuously is supplied. The manufacture approach of the automatic in-the-car wearing bulky piloerection nonwoven fabric characterized by supplying what formed the pile of the staple fiber web for design layers in the front face by needle punch after each laminated, cut a part for the point to an even length by shirring processing further, and unified a part for a part for a design layer, and a base material layer.

[Claim 17] As a matrix fiber, 98 - 76 % of the weight of 2-30-denier high-melting polyester system coloring staple fiber, As thermal melting arrival nature binder fiber Low-melt point point copoly ester carries out after [a blend] carding of the 2 - 24 % of the weight of the 1-20-denier polyester system thermal melting arrival nature coloring staple fiber which has the conjugate structure of occupying a part of fiber front face [at least]. Nothing [for design layers / the coloring staple fiber web and nothing], As a matrix fiber, separately 95 - 30 % of the weight of high-melting polyester system staple fiber with an average size of 1.5-40 deniers, Low-melt point point copoly ester carries out after [a blend] carding of the 5 - 70 % of the weight of the thermal melting arrival nature staple fiber with an average size of 1-20 deniers which has the polyester system conjugate structure of occupying a part of fiber front face [at least] as thermal melting arrival nature binder fiber. The staple fiber web for base material layers, and nothing, Subsequently, the above-mentioned staple fiber web for design layers and the staple fiber web for base material layers are devised to two or more continuous cross layers. Supply the staple fiber web for design layers colored from at least one set of the cross layer containing the object for outermost layer web supply, and a web layered product is formed. The manufacture approach of the automatic in-the-car wearing bulky piloerection nonwoven fabric characterized by forming a pile in a front face further using a fork needle etc., carrying out shirring processing, cutting [to unify the whole by needle punching after that,] a part for the point of a pile part to an even length, and carrying out a heat setting if needed.

[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the bulky piloerection nonwoven fabric used for the partition side of habitation space, especially the interiors of an automobile, such as head lining, a wall, and a floor (carpet).
[0002]
[Description of the Prior Art] Conventionally, the nonwoven fabric which has a vertical section configuration as shown in drawing 1 -3 as the partition side of habitation space, such as head lining, a wall, and a floor (carpet), or interior material of an automobile is known. What is shown in drawing 1 is the example which stuck the nonwoven fabric epidermis 2 on the comparatively harder base material 2, in order to acquire configuration sense of stability, as indicated by JP,4-3033637,A. In this case, as a base material 2, a steel plate, concrete, a woody board, the resin board, corrugated paper, the resin felt, etc. are used. The fine sight as interior material is [the nonwoven fabric epidermis 1] securable adhesion or by carrying out a laminating on these base materials.
[0003] What is shown in drawing 2 is an example which has improved tactile feeling and sound absorbing and insulating properties by using the foam sheets and felt which have cushioning properties softly, such as polyurethane and polyethylene, as a base material (base material) 4 between a base material and epidermis 3. For example, it is indicated by each official report, such as JP,61-237630,A, JP,2-162171,A, 3-176241, and 4-176742.
[0004] Moreover, drawing 3 sticks the nonwoven fabric epidermis 5 on the nonwoven fabric 6 which can be fabricated as a base material, is tactile feeling and an example which has improved sound absorbing and insulating properties, and is proposed as JP,5-30681,A and 5-118217.
[0005] However, even if it sticks the nonwoven fabric epidermis 1 on the hard base material 2 in the case of drawing 1 , there is a trouble of tactile feeling being hard in addition and spoiling a high-class feeling. Moreover, when sound absorbing and insulating properties are required of interior material and a base material 2 is hard, there is no permeability, or it will be in a very small condition, and there is also a trouble that sufficient sound absorbing and insulating properties are not obtained.
[0006] In the case of drawing 2 , although improved, a configuration becomes complicated, and tactile feeling and sound absorbing and insulating properties will cause the rise of ingredient cost or a manufacturing cost, and are not desirable.
[0007] There is a trouble of the cost rise by the increment in a man day, such as in the case of drawing 3 , needing the process which sticks again what was manufactured separately, respectively, using epidermis 5 and the same nonwoven fabric as a base material 6, although tactile feeling and sound absorbing and insulating properties improve.
[0008]
[Problem(s) to be Solved by the Invention] This invention was made paying attention to such a conventional trouble, gives a surface design to one [at least] front face by needle punch etc., offers the interior material which consists of a nonwoven fabric of the single structure which combined still more flexible tactile feeling and outstanding sound absorbing and insulating properties while unifying and having simulataneously the support function of a base material layer, and a buffer function and the aesthetic function of epidermis, and aims at solving the above-mentioned trouble.
[0009]
[Means for Solving the Problem] While configuration fiber including one [at least] front face is colored and the bulky piloerection nonwoven fabric for interior material of this invention constitutes a nonwoven fabric design

layer, it forms the pile which a part of configuration fiber of this nonwoven fabric that continued all over the front face further and was colored coming [a nonwoven fabric base material layer with the firmness enhancement function and the buffer function by which the laminating was carried out to this design layer in one] projected, and comes to carry out the phanerosis in a design pattern. Moreover, the bulky piloerection nonwoven fabric for interior material of this invention consists of a staple fiber of a thermoplastic synthetic fiber as a whole, and it comes to blend the matrix fiber of high-melting polyester fiber, and thermal melting arrival nature binder fiber at the specific rate of a compounding ratio most preferably, and the intersection of configuration fiber pastes up by binder fiber, and consists of sound-absorbing-and-insulating nonwoven fabrics with which the paste up point was stabilized in the whole nonwoven fabric by the gestalt which comes to be distribute over homogeneity substantially.

[0010] Carding is blended and carried out. the manufacturing method of the bulky piloerection nonwoven fabric for interiors of this invention the matrix fiber and thermal melting arrival nature binder fiber staple which consist of a high-melting synthetic-fiber staple at the specific rate of a compounding ratio, respectively A design layer and the web for base material layers are produced on another object, the laminating of both is carried out and molding unification is carried out in needle punch and/or heating adhesion. Subsequently a fork needle etc. -- using -- a front face -- a pile -- forming -- a part for the point of a pile part -- shirring processing -- cutting to an even length -- the predetermined difference of elevation desirable suitably -- with, it cuts to an even length, the shank of a code tone or the Di Roar tone is taken out, and it consists of carrying out a heat setting if needed.

[0011]

[Embodiment of the Invention] Configuration fiber combination of the above-mentioned nonwoven fabric design layer comes to blend 76 - 98 % of the weight of 2-30-denier high-melting polyester system staple fiber, and 2 - 24 % of the weight of 1-20-denier polyester system thermal melting arrival nature staple fiber which has the conjugate structure where low-melt point point copoly ester occupies a part of fiber front face [at least] as thermal melting arrival nature binder fiber as a matrix fiber.

[0012] The above-mentioned thermal melting arrival nature binder fiber joins a part of intersection [at least] with nonwoven fabric configuration fiber by thermal melting arrival, and stabilizes the nonwoven fabric design layer fabricated by the predetermined configuration. Although this binder fiber is preferably blended five to 20% of the weight two to 24% of the weight on nonwoven fabric design layer weight criteria less than 2 % of the weight -- fiber -- indirect -- the hair omission from the pile section occurring frequently while in use, since a goal decreases, and also since it is difficult to get, if it, on the other hand, exceeds 24 % of the weight for sufficient configuration holdout by hot forming preferably, and also it will cause a cost rise -- fiber -- indirect, since goals increase in number There is a possibility that shanks formed in one field of a nonwoven fabric design layer, such as a code tone and the Di Roar tone, may change after hot forming, and the failure by hair etc. may arise after shaping heating, and an appearance top problem may arise. Furthermore, if the binder fiber of a design layer is limited to 5 - 20% of the weight of the range, all the above-mentioned concern will be canceled, the hair omission of a pile will be prevented completely, there will also be no fear of hair failure generating after shaping heating, and good gestalt stability will be acquired.

[0013] Moreover, although the fineness of the thermal melting arrival nature polyester system conjugate fiber used for this design layer is in the range of 1-20 deniers, it is 2-15 deniers still more preferably. if a raw thread manufacturing cost rises upwards, a problem arises in the card permeability of a nonwoven fabric chemically-modified degree, and the good nonwoven fabric of quality becomes difficult to get in less than 1 denier and it exceeds 20 deniers -- reduction of a fiber number -- following -- fiber -- indirect -- a goal -- decreasing -- hot forming -- sufficient configuration holdout ******** -- hard -- since it becomes, it is not desirable. Furthermore, if the above-mentioned fineness is limited to the range of 2-15 deniers, it will contribute to the cost cut of an expensive conjugate fiber, and also the design layer in which gestalt stability was further improved by the quality list is obtained. Moreover, it is not desirable that a problem will arise in the card permeability of a nonwoven fabric chemically-modified degree like the above if the fineness of the high-melting polyester matrix fiber which constitutes the above-mentioned design layer becomes less than 2 deniers, the texture of a pile will become coarse if the good nonwoven fabric original fabric of quality becomes difficult to get and exceeds 30 deniers on the other hand, and a feeling of rough ** increases etc. in respect of aesthetic property.

[0014] In order to color a predetermined color an original fabric, it is desirable to make the both sides or either of the above-mentioned polyester into the so-called arrival fiber at Hara which adds a pigment in a spinning raw material and colors it in a spinning phase, and it is also possible to add an illuminant-proof etc.

[0015] Furthermore, although the thermal melting arrival nature polyester fiber as the high-melting polyester

fiber and binder fiber as a matrix fiber is blended and used for the nonwoven fabric base material layer which a laminating is carried out to this design layer in one, and has a firmness enhancement function and a buffer function Configuration fiber combination of a nonwoven fabric base material layer high-melting polyester system staple fiber with an average size of 1.5-40 deniers on the weight criteria of a nonwoven fabric base material as a matrix fiber 30 - 95 % of the weight, Low-melt point point copoly ester comes to blend [5 - 70 % of the weight] thermal melting arrival nature staple fiber with an average size of 1-20 deniers which has the polyester system conjugate structure of occupying a part of fiber front face [at least] on the weight criteria of a nonwoven fabric base material as thermal melting arrival nature binder fiber.

[0016] Since the rigidity of fiber itself is small when the average size of the high-melting polyester system staple fiber which constitutes the above-mentioned nonwoven fabric base material layer is less than 1.5 deniers, the firmness enhancement list as a core material runs short of buffer functions, a manufacturing cost cannot rise by the fall of a spinning rate further, or the permeability of the carding machine at the time of nonwoven-fabric-izing cannot fall, and a quality nonwoven fabric base material cannot be obtained cheaply. On the other hand, if it exceeds 40 deniers, the fiber total number per unit volume in a fiber aggregate will decrease, a pasting up point with binder fiber decreases, and it becomes difficult to acquire sufficient rigidity. Moreover, since the value of surface area/cross sectional area becomes small when the diameter of fiber becomes thick, it is hard coming to absorb the energy of a sound efficiently.

[0017] The thermal melting arrival nature polyester system binder fiber which constitutes the above-mentioned nonwoven fabric base material layer is preferably blended ten to 60% of the weight five to 70% of the weight on the weight criteria of the nonwoven fabric layer concerned. less than 5 % of the weight -- fiber -- indirect -- and also it will cause a cost rise on the other hand preferably if it exceeds 70 % of the weight since sufficient configuration holdout is hard to be acquired when hot forming is carried out, since a goal decreases -- fiber -- indirect -- in order that goals may increase in number, compression repulsive force becomes excessive, and it may be hard coming to demonstrate a moderate buffer function Furthermore, the base material layer which most moderate number of pasting up points were acquired and was equipped with the outstanding gestalt stability and a buffer function is offered at rational cost by limiting the above-mentioned loadings to 10 - 60% of the weight of the range.

[0018] The high-melting polyester fiber used for this invention is fiber which makes a main constituent fiber formation nature thermoplasticity aromatic polyester, and polyethylene terephthalate system fiber, polybutylene terephthalate system fiber, polyethylenenaphthalate system fiber, Pori (p-oxybenzoate) system fiber, Pori [p-(2-hydroxyethyl) oxybenzoate] system fiber, etc. can be illustrated especially. among those -- especially -- acquisition -- when the melting point, tensile strength, and a modulus use as a matrix fiber comparatively highly, since an easy polyethylene terephthalate fiber achieves firmness enhancement and a buffer function effectively, it is desirable. Furthermore, along with a fiber axis, the conjugate fiber compounded with the eccentric sheath-core mold or the side-by-side mold has eccentric, for example, the special feature which discovers crimp by heat treatment, and raises whenever [confounding / of a nonwoven fabric], and a moldability increases, in gay polyester, copolymerized polyester, or denaturation polyester. Furthermore, as a cross-section configuration of the above-mentioned high-melting polyester fiber, it is circular and also especially a limit does not have flat, Y mold, a hollow mold, etc.

[0019] Moreover, as low-melt point point copoly ester used for binder fiber, a copolymer or blend polymer, and the polyester system thermal melting arrival nature polymer that reduced the melting point to polyethylene terephthalate copolymerization or by blending typically in comonomers, such as isophthalic acid, are usually used suitably. It is possible to use the copoly ester which carried out ring breakage of dibasic-acid components, such as a terephthalic acid, isophthalic acid, and an adipic acid, diol components, such as ethylene glycol, propylene glycol, a diethylene glycol, triethylene glycol, a polyethylene glycol, and a polypropylene glycol, or the lactone, and copolymerized it generally. As gay polyester which has a support function, although there is especially no limitation, the polyeser which has a component according to polyethylene terephthalate or it is cheap, and is the most desirable.

[0020] Furthermore, although the single component fiber which consists of the above-mentioned thermal melting arrival nature polymer is sufficient as it, if this thermal melting arrival nature polymer uses the conjugate fiber which occupies a part of fiber front face [at least], and the sheath-core mold conjugate fiber which uses a homopolymer as a heart component and uses a thermal melting arrival nature copolymerization polymer as a sheath component especially, since binder fiber can achieve a thermal melting arrival function, with the support function of a heart component maintained, it is the most suitable again. Moreover, a side-by-side mold conjugate fiber, then the formation of a welding point which decreased too much can also protect hardening of a nonwoven fabric.

[0021] Binder fiber can be softened or fused by heat treatment, for example, heat treatment by the temperature below the softening temperature of the matrix fiber which consists of high-melting polyester, and can discover welding nature. Although heat treatment is performed under the softening temperature temperature of a matrix fiber above the welding nature manifestation temperature of binder fiber, it can also carry out in connection with a heating forming cycle also as an independent process. By this heat treatment, paste up the configuration fiber which crosses binder fiber on an intersection, and gestalt stability is given to a nonwoven fabric, and also binder fiber collaborates with the support function of a matrix fiber, and gives moderate rigidity to a nonwoven fabric. Furthermore, the shape of toothing installed in the field of a nonwoven fabric is absorbed by use of binder fiber again, or it also becomes possible to give irregularity intentionally to stability on a nonwoven fabric front face.

[0022] It is desirable still more desirable that it is the range of 100-230 degrees C, and the range of the melting point of low-melt point point copoly ester is 105-210 degrees C. There is a problem from which tacking happens [the melting point] by the welding between single yarn at less than 100 degrees C in the case of spinning, and also there is a trouble that **** becomes difficult by the welding between multifilament. Not only a low-melt point point component but a high-melting component may be softened or fused at the time of heating, and it becomes massive, if the melting point exceeds 230 degrees C, the configuration as fiber may be lost and it may become an appearance top problem, and also whenever [stoving temperature] goes up and shaping becomes difficult. By using the low-melt point point copoly ester in the range whose above-mentioned melting point is 105-210 degrees C, it is possible to cancel the above-mentioned trouble completely.

[0023] As for the average thickness after fabricating the bulky piloerection nonwoven fabric for interiors of this invention, it is desirable that it is 1-50mm. When in the case of less than 1mm the flexural rigidity fall inclination by the lack of thickness cannot be denied, it becomes in reinforcement and weak and rigidity is able to be secured, desired moderate quantity of airflow will not be obtained, but it will become difficult to give engine performance, such as absorption of sound or noise insulation, to interior material. Furthermore, with the pressure which acts at the time of molding, there is also a possibility of spoiling surface aesthetic property and appearance. On the other hand, in a low consistency, if 50mm is exceeded, since the bending elastic modulus per unit cross section of the core material itself becomes small, and since the self-weight of a core material becomes large when it is high density, deformation by self-weight, lappet going down, setting, etc. will be seen, and firmness ability will fall.

[0024] Moreover, it sets in the condition that the laminating was carried out, the thickness before molding is 5-70mm, and the bulky piloerection nonwoven fabric for interiors of this invention is 300 - 2000 g/m2. It is desirable to have surface density (eyes). Since the thickness of an original fabric is too large when thickness is less than 5mm, it is difficult to secure desired surface density and it exceeds 70mm on the other hand, workability, such as handling at the time of molding, falls. Moreover, surface density is 300 g/m2. When it is the following, the function as a buffer coat cannot fully be demonstrated with lack of compression repulsive force, and it is 2000 g/m2. When it exceeds, the fiber aggregate is too hard and a front face stops equipping with desired aesthetic property after molding.

[0025] The staple fiber web which the manufacturing method of the bulky piloerection nonwoven fabric for interiors of this invention becomes from the thermoplastic synthetic fiber preferably colored [textile printing / the arrival at Hara, dyeing,] as a design layer by the arrival at Hara, The laminating of the firmness enhancement and the staple fiber web for buffer coats which serve as it from the above produced by another object, coloring of the same kind, or a non-coloring thermoplasticity synthetic fiber is carried out, and the molding unification of both is carried out in needle punch and/or heating adhesion. Subsequently a fork needle etc. -- using -- a front face -- a pile -- forming -- a part for the point of a pile part -- shirring processing --. cutting to an even length -- the predetermined difference of elevation desirable suitably -- with, it cuts to an even length and **** to a code tone or the Di Roar tone.

[0026] The suitable example of the above-mentioned manufacturing method as a matrix fiber 76 - 98 % of the weight of moreover, 2-30-denier high-melting polyester system staple fiber, As thermal melting arrival nature binder fiber, low-melt point point copoly ester blends 2 - 24 % of the weight of 1-20-denier polyester system thermal melting arrival nature staple fiber which has the conjugate structure of occupying a part of fiber front face [at least]. Carding is carried out by the method and the staple fiber web for nonwoven fabric design layers is produced. a law -- as a matrix fiber separately with 30 - 95 % of the weight of high-melting polyester system staple fiber with an average size of 1.5-40 deniers Low-melt point point copoly ester blends 5 - 70 % of the weight of thermal melting arrival nature staple fiber with an average size of 1-20 deniers which has the polyester system conjugate structure of occupying a part of fiber front face [at least] as thermal melting arrival nature binder fiber. a law -- carding is carried out by the method and the staple fiber web for nonwoven

fabric base material layers is produced. the staple fiber web for design layers -- for example, the arrival fiber at Hara -- with, it is good to carry out constituting etc. and to be colored. Subsequently, these staple fiber webs are devised to two or more continuous cross layers. The staple fiber web for design layers colored from at least one set of the cross layer containing the object for outermost layer web supply is supplied. A web layered product and nothing, The whole is unified by needle punching after that, further, a pile is formed in a front face using a fork needle etc., shirring processing is carried out, a part for the point of a pile part is cut to an even length, and a heat setting is carried out if needed. This approach enables mass production by the continuous process.

[0027] Thus, the bulky piloerection nonwoven fabric by which laminating unification was carried out can be fabricated at one process by heating at the temperature between the melting point of said high-melting polyester, and the melting point of low-melt point point copoly ester. This bulky piloerection nonwoven fabric for interior material is equipped with the improved cushioning properties and flexible tactile feeling accompanied by a high-class feeling, and has the further excellent sound-absorbing-and-insulating ability.

[0028]

[Example] Hereafter, the example of this invention is shown with the effectiveness. The measuring method of each characteristic value in an example, the example of a comparison, and the conventional example was based on the following approach.

[0029] Based on JISA1405 "the normal incidence sound absorption coefficient measuring method of the building material by the pipe method", the acoustic absorptivity was measured for the interior material for automobiles obtained by the approach of measuring method 1 (absorption-of-sound nature measurement) example, the example of a comparison, and the conventional example, and absorption-of-sound nature was evaluated. Sample size phi100mm, 125-1600Hz of measuring range.

[0030] (Abrasion test) Based on JISK7204 "the abrasion test approach of the plastics by the wear ring", abrasiveness ability was measured for the interior material for automobiles obtained by the approach of an example, the example of a comparison, and the conventional example, and abrasiveness was evaluated. Load 250gf, count of trial 100 rotation.

[0031] (Example 1) usual polyethylene terephthalate staple fiber [of the circular cross section of 10 denier 51mm length which did arrival at Hara of the design layer to gray as combination of a nonwoven fabric]: -- the thermal melting arrival which has the sheath-core structure of 4-denier 51mm length which carried out arrival at Hara to gray similarly 90% of the weight -- sex polyester system staple fiber (110-degree-C melting type):10 % of the weight, 400g of eyes/, and m2 ** -- it carried out. Furthermore, thermal-melting arrival nature polyester system staple fiber for which fiber combination of a base-material layer has the sheath-core structure of 2 denier 51mm length usual polyethylene-terephthalate staple fiber:95% of the weight of the circular cross section of 13 denier 51mm length (170 degree-C melting type): It is 5 % of the weight, 600g of eyes/, and m2. It carried out. Next, the laminating of a design layer and the base material layer was continuously carried out for these fiber through a blend, carding, the cross layer, and the needle punching process, respectively, and the nonwoven fabric original fabric was obtained. Furthermore, after making the design layer of the obtained original fabric penetrate a fork needle and forming the pile section, shirring processing was carried out, ****** of the Di Roar tone was performed, and the bulky piloerection nonwoven fabric with a thickness of 40mm was obtained. The obtained piloerection laminating nonwoven fabric original fabric was heated at 180 degrees C, it supplied to the press machine with which it was equipped with the die, and the Plastic solid was acquired. The configuration holdout after shaping is good, a taper abrasion test result is also good, the aesthetic property of the Di Roar tone was also maintained, and the thing of a request of a color tone was obtained.

[0032] (Example 2) usual polyethylene terephthalate staple fiber [of the circular cross section of 2 denier 51mm length which did arrival at Hara of the design layer to gray as combination of a nonwoven fabric]: -- the thermal melting arrival which has the sheath-core structure of 2-denier 51mm length which carried out arrival at Hara to gray similarly 95% of the weight -- it ****ed to 200g of eyes/, and m2 sex polyester system staple fiber (110-degree-C melting type):5% of the weight. Furthermore, thermal-melting arrival nature polyester system staple fiber for which fiber combination of a base-material layer has the sheath-core structure of 1.5 denier 51mm length usual polyethylene-terephthalate staple fiber:85% of the weight of the circular cross section of 6 denier 51mm length (110 degree-C melting type): It is 15 % of the weight, 100g of eyes/, and m2. It carried out. Next, the laminating of a design layer and the base material layer was continuously carried out for these fiber through a blend, carding, the cross layer, and the needle punching process, respectively, and the nonwoven fabric original fabric was obtained. Furthermore, after making the design layer of the obtained original fabric penetrate a fork needle and forming the pile section, shirring processing was carried out, ****** of the Di Roar tone was performed, and the bulky piloerection nonwoven fabric with a thickness of 7mm was

obtained. The obtained piloerection laminating nonwoven fabric original fabric was heated at 150 degrees C, it supplied to the press machine with which it was equipped with the die, and the Plastic solid was acquired. The configuration holdout after shaping is good, a taper abrasion test result is also good, the aesthetic property of the Di Roar tone was also maintained, and the thing of a request of a color tone was obtained.

[0033] (Example 3) usual polyethylene terephthalate staple fiber [of the circular cross section of 20 denier 51mm length which did arrival at Hara of the design layer to gray as combination of a nonwoven fabric]: -- the thermal melting arrival which has the sheath-core structure of 15-denier 51mm length which carried out arrival at Hara to gray similarly 80% of the weight -- sex polyester system staple fiber (110-degree-C melting type):20 % of the weight, 500g of eyes/, and m2 ** -- it carried out. Furthermore, thermal-melting arrival nature polyester system staple fiber for which fiber combination of a base-material layer has the sheath-core structure of 6 denier 51mm length usual polyethylene-terephthalate staple fiber:80% of the weight of the circular cross section of 2 denier 51mm length (200 degree-C melting type): It is 20 % of the weight, 1500g of eyes/, and m2. It carried out. Next, the laminating of a design layer and the base material layer was continuously carried out for these fiber through a blend, carding, the cross layer, and the needle punching process, respectively, and the nonwoven fabric original fabric was obtained. Furthermore, after making the design layer of the obtained original fabric penetrate a fork needle and forming the pile section, shirring processing was carried out, ****** of the Di Roar tone was performed, and the bulky piloerection nonwoven fabric with a thickness of 70mm was obtained. The obtained piloerection laminating nonwoven fabric original fabric was heated at 210 degrees C, it supplied to the press machine with which it was equipped with the die, and the Plastic solid was acquired. The configuration holdout after shaping is good, a taper abrasion test result is also good, the aesthetic property of the Di Roar tone was also maintained, and the thing of a request of a color tone was obtained.

[0034] (Example 4) usual polyethylene terephthalate staple fiber [of the circular cross section of 13 denier 51mm length which did arrival at Hara of the design layer to gray as combination of a nonwoven fabric]: -- the thermal melting arrival which has the sheath-core structure of 10-denier 51mm length which carried out arrival at Hara to gray similarly 76% of the weight -- sex polyester system staple fiber (110-degree-C melting type):24 % of the weight, 400g of eyes/, and m2 ** -- it carried out. Furthermore, thermal-melting arrival nature polyester system staple fiber for which fiber combination of a base-material layer has the sheath-core structure of 20 denier 51mm length usual polyethylene-terephthalate staple fiber:30% of the weight of the circular cross section of 40 denier 51mm length (170 degree-C melting type): It is 70 % of the weight, 600g of eyes/, and m2. It carried out. Next, the laminating of a design layer and the base material layer was continuously carried out for these fiber through a blend, carding, the cross layer, and the needle punching process, respectively, and the nonwoven fabric original fabric was obtained. Furthermore, after making the design layer of the obtained original fabric penetrate a fork needle and forming the pile section, shirring processing was carried out, ****** of the Di Roar tone was performed, and the bulky piloerection nonwoven fabric with a thickness of 50mm was obtained. The obtained piloerection laminating nonwoven fabric original fabric was heated at 180 degrees C, it supplied to the press machine with which it was equipped with the die, and the Plastic solid was acquired. The configuration holdout after shaping is good, a taper abrasion test result is also good, the aesthetic property of the Di Roar tone was also maintained, and the thing of a request of a color tone was obtained.

[0035] (Example 5) usual polyethylene terephthalate staple fiber [of the circular cross section of 10 denier 51mm length which did arrival at Hara of the design layer to gray as combination of a nonwoven fabric]: -- the thermal melting arrival which has the sheath-core structure of 4-denier 51mm length which carried out arrival at Hara to gray similarly 85% of the weight -- sex polyester system staple fiber (110-degree-C melting type):15 % of the weight, eyes 320/m2 ** -- it carried out. Furthermore, thermal-melting arrival nature polyester system staple fiber for which fiber combination of a base-material layer has the sheath-core structure of 2 denier 51mm length usual polyethylene-terephthalate staple fiber:90% of the weight of the circular cross section of 13 denier 51mm length (170 degree-C melting type): It is 10 % of the weight, 1050g of eyes/, and m2. It carried out. Next, the laminating of a design layer and the base material layer was continuously carried out for these fiber through a blend, carding, the cross layer, and the needle punching process, respectively, and the nonwoven fabric original fabric was obtained. Furthermore, after making the design layer of the obtained original fabric penetrate a fork needle and forming the pile section, shirring processing was carried out, ****** of the Di Roar tone was performed, and the bulky piloerection nonwoven fabric with a thickness of 40mm was obtained. The obtained piloerection laminating nonwoven fabric original fabric was heated at 180 degrees C, it supplied to the press machine with which it was equipped with the die, and the Plastic solid was acquired. The configuration holdout after shaping is good, a taper abrasion test result is also good, the aesthetic property of the Di Roar tone was also maintained, and the thing of a request of a color tone was obtained.

[0036] (Example 6) usual polyethylene terephthalate staple fiber [of the circular cross section of 10 denier

51mm length which did arrival at Hara of the design layer to gray as combination of a nonwoven fabric]: -- the thermal melting arrival which has the sheath-core structure of 4-denier 51mm length which carried out arrival at Hara to gray similarly 85% of the weight -- sex polyester system staple fiber (110-degree-C melting type):15 % of the weight, 320g of eyes/, and m2 ** -- it carried out. Furthermore, thermal-melting arrival nature polyester system staple fiber for which fiber combination of a base-material layer has the sheath-core structure of 2 denier 51mm length usual polyethylene-terephthalate staple fiber:90% of the weight of the circular cross section of 13 denier 51mm length (170 degree-C melting type): It is 10 % of the weight, 1050g of eyes/, and m2. It carried out. Next, the laminating of the above-mentioned design layer which only the design layer produced fiber with another object with the base material layer through a blend, carding, the cross layer, and the needle punching process, and performed a blend, carding, and a cross layer continuously and produced the fiber of a base material layer with another object on it further next was carried out, and the nonwoven fabric original fabric with a thickness of 40mm which unified the whole by needle punching was obtained. The obtained piloerection laminating nonwoven fabric original fabric was heated at 180 degrees C, it supplied to the press machine with which it was equipped with the die, and the Plastic solid was acquired. The configuration holdout after shaping is good, a taper abrasion test result is also good, the aesthetic property of the Di Roar tone was also maintained, and the thing of a request of a color tone was obtained.

[0037] (Example 1 of a comparison) usual polyethylene terephthalate staple fiber [of the circular cross section of 40 denier 51mm length which did arrival at Hara of the design layer to gray as combination of a nonwoven fabric]: -- the thermal melting arrival which has the sheath-core structure of 30-denier 51mm length which carried out arrival at Hara to gray similarly 75% of the weight -- sex polyester system staple fiber (110-degree-C melting type):25 % of the weight, 300g of eyes/, and m2 ** -- it carried out. Furthermore, thermal-melting arrival nature polyester system staple fiber for which fiber combination of a base-material layer has the sheath-core structure of 2 denier 51mm length usual polyethylene-terephthalate staple fiber:90% of the weight of the circular cross section of 13 denier 51mm length (170 degree-C melting type): It is 10 % of the weight, 1000g of eyes/, and m2. It carried out. Next, the laminating of a design layer and the base material layer was continuously carried out for these fiber through a blend, carding, the cross layer, and the needle punching process, respectively, and the nonwoven fabric original fabric was obtained. Furthermore, after making the design layer of the obtained original fabric penetrate a fork needle and forming the pile section, shirring processing was carried out, ****** of the Di Roar tone was performed, and the bulky piloerection nonwoven fabric with a thickness of 50mm was obtained. The obtained piloerection laminating nonwoven fabric original fabric was heated at 180 degrees C, it supplied to the press machine with which it was equipped with the die, and the Plastic solid was acquired. Although the configuration holdout after shaping was good, since the diameter of fiber of a design layer was large, desired appearance and tactile feeling were not obtained.

[0038] (Example 2 of a comparison) usual polyethylene terephthalate staple fiber [of the circular cross section of 10 denier 51mm length which did arrival at Hara of the design layer to gray as combination of a nonwoven fabric]: -- the thermal melting arrival which has the sheath-core structure of 4-denier 51mm length which carried out arrival at Hara to gray similarly 90% of the weight -- sex polyester system staple fiber (110-degree-C melting type):10 % of the weight, 300g of eyes/, and m2 ** -- it carried out. Furthermore, thermal-melting arrival nature polyester system staple fiber for which fiber combination of a base-material layer has the sheath-core structure of 2 denier 51mm length usual polyethylene-terephthalate staple fiber:97% of the weight of the circular cross section of 13 denier 51mm length (230 degree-C melting type): It is 3 % of the weight, 500g of eyes/, and m2. It carried out. Next, the laminating of a design layer and the base material layer was continuously carried out for these fiber through a blend, carding, the cross layer, and the needle punching process, respectively, and the nonwoven fabric original fabric was obtained. Furthermore, after making the design layer of the obtained original fabric penetrate a fork needle and forming the pile section, shirring processing was carried out, ****** of the Di Roar tone was performed, and the bulky piloerection nonwoven fabric was obtained. Although the obtained piloerection laminating nonwoven fabric original fabric was heated at 250 degrees C, the whole nonwoven fabric fused and a desired Plastic solid was not acquired.

[0039] (Example 3 of a comparison) usual polyethylene terephthalate staple fiber [of the circular cross section of 10 denier 51mm length which did arrival at Hara of the design layer to gray as combination of a nonwoven fabric]: -- the thermal melting arrival which has the sheath-core structure of 4-denier 51mm length which carried out arrival at Hara to gray similarly 90% of the weight -- sex polyester system staple fiber (110-degree-C melting type):10 % of the weight, 300g of eyes/, and m2 ** -- it carried out. Furthermore, thermal-melting arrival nature polyester system staple fiber for which fiber combination of a base-material layer has the sheath-core structure of 25 denier 51mm length usual polyethylene-terephthalate staple fiber:80% of the weight of the circular cross section of 60 denier 51mm length (110 degree-C melting type): It is 20 % of the weight, 700g of

eyes/, and m2. It carried out. Next, the laminating of a design layer and the base material layer was continuously carried out for these fiber through a blend, carding, the cross layer, and the needle punching process, respectively, and the nonwoven fabric original fabric was obtained. Furthermore, after making the design layer of the obtained original fabric penetrate a fork needle and forming the pile section, shirring processing was carried out, ****** of the Di Roar tone was performed, and the bulky piloerection nonwoven fabric with a thickness of 50mm was obtained. The obtained piloerection laminating nonwoven fabric original fabric was heated at 180 degrees C, it supplied to the press machine with which it was equipped with the die, and the Plastic solid was acquired. Although the configuration holdout after shaping is good, a taper abrasion test result is also good and the aesthetic property of the Di Roar tone was also maintained, since the diameter of fiber of a base material layer was large, the desired absorption-of-sound engine performance was not obtained.

[0040] (Example 4 of a comparison) usual polyethylene terephthalate staple fiber [of the circular cross section of 10 denier 51mm length which did arrival at Hara of the design layer to gray as combination of a nonwoven fabric]: -- the thermal melting arrival which has the sheath-core structure of 4-denier 51mm length which carried out arrival at Hara to gray similarly 90% of the weight -- sex polyester system staple fiber (110-degree-C melting type):10 % of the weight, 150g of eyes/, and m2 ** -- it carried out. Furthermore, thermal-melting arrival nature polyester system staple fiber for which fiber combination of a base-material layer has the sheath-core structure of 2 denier 51mm length usual polyethylene-terephthalate staple fiber:90% of the weight of the circular cross section of 13 denier 51mm length (170 degree-C melting type): It is 10 % of the weight, 50g of eyes/, and m2. It carried out. Next, the laminating of a design layer and the base material layer was continuously carried out for these fiber through a blend, carding, the cross layer, and the needle punching process, respectively, and the nonwoven fabric original fabric was obtained. Furthermore, after making the design layer of the obtained original fabric penetrate a fork needle and forming the pile section, shirring processing was carried out, ****** of the Di Roar tone was performed, and the bulky piloerection nonwoven fabric with a thickness of 5mm was obtained. The obtained piloerection laminating nonwoven fabric original fabric was heated at 180 degrees C, it supplied to the press machine with which it was equipped with the die, and the Plastic solid was acquired. The configuration holdout after shaping could not be said as fitness with the lack of surface density of a base material layer, and a good thing was not obtained for the appearance of a surface layer with the lack of surface density. Although it is good, a taper abrasion test result is also good and the aesthetic property of the Di Roar tone was also maintained, since the diameter of fiber of a base material layer was large, the desired absorption-of-sound engine performance was not obtained.

[0041] (Conventional example 1) The nonwoven fabric original fabric was obtained through carding, the cross layer, and the needle punching process using the polyester fiber by which arrival at Hara was carried out. Furthermore, after making the obtained original fabric penetrate a fork needle and forming the pile section, shirring processing was carried out, ****** of the Di Roar tone was performed, the rear face was coated with the latex, and the DIROA carpet used conventionally was obtained. The felt (25mm thickness, the surface density of 1.2kg/m2) was made into the buffer coat, the needle nonwoven fabric (thickness of 3mm) on which the DIROA carpet was printed was used as epidermis, and it heated at 180 degrees C, and supplied to the press machine with which it was equipped with the die, and the Plastic solid was acquired.

[0042] (Conventional example 2) The nonwoven fabric original fabric was obtained through carding, the cross layer, and the needle punching process using the polyester fiber by which arrival at Hara was carried out. Furthermore, after making the obtained original fabric penetrate a fork needle and forming the pile section, shirring processing was carried out, ****** of the Di Roar tone was performed, the rear face was coated with the latex, and the DIROA carpet used conventionally was obtained. Furthermore, thermal-melting arrival nature polyester system staple fiber for which the fiber combination has the sheath-core structure of 2 denier 51mm length usual polyethylene-terephthalate staple fiber:90% of the weight of the circular cross section of 13 denier 51mm length, using a polyester nonwoven fabric as a buffer coat (170 degree-C melting type): It is 10 % of the weight, 500g of eyes/, and m2. It carried out. Next, the nonwoven fabric original fabric was obtained for these fiber through a blend, carding, and a cross layer process, respectively. The needle nonwoven fabric (thickness of 3mm) on which the DIROA carpet was printed was used as epidermis, and it heated at 180 degrees C, and supplied to the press machine with which it was equipped with the die, and the Plastic solid was acquired.

[0043] The structure of the bulky piloerection nonwoven fabric of each above-mentioned example, the example of a comparison, and the conventional example is shown in Table 1 by comparison.

[0044]

[Table 1]

	意匠層					面密度	基材層					面密度	成形前厚み
	マトリックス繊維		バインダー繊維				マトリックス繊維		バインダー繊維				
	含有量 (wt%)	繊度 (デニール)	含有量 (wt%)	繊度 (デニール)	融点 (℃)	(g/m²)	含有量 (wt%)	繊度 (デニール)	含有量 (wt%)	繊度 (デニール)	融点 (℃)	(g/m²)	(mm)
実施例1	90	10	10	4	110	400	95	13	5	2	170	600	40
実施例2	95	2	5	2	110	200	85	6	15	1.5	110	100	7
実施例3	80	20	20	15	110	500	80	2	20	6	200	1500	70
実施例4	76	13	24	10	110	400	30	40	70	20	170	600	50
実施例5	85	10	15	4	110	320	90	13	10	2	170	1050	40
実施例6	85	10	15	4	110	320	90	13	10	2	170	1050	40
比較例1	75	40	25	30	110	300	90	13	10	2	170	1000	50
比較例2	90	10	10	4	110	300	97	13	3	2	230	500	–
比較例3	90	10	10	4	110	300	80	60	20	25	110	700	50
比較例4	90	10	10	4	110	150	90	13	10	2	170	50	5
従来例1	ポリエステル製デイロアカーペット					300	レジンフェルト					1200	30
従来例2	ポリエステル製デイロアカーペット					300	90	13	10	2	170	500	30

[0045] Moreover, the result compared about appearance, tactile feeling, absorption-of-sound nature, the simplicity of a configuration, and abrasion resistance is shown in Table 2, respectively about the nonwoven fabric obtained in each example, the example of a comparison, and the conventional example 2, and the interior material of the conventional example 1.

[0046]

[Table 2]

	見栄え	触感	吸音性	構成の簡便さ	耐摩耗性	比較対象例
実施例1	◎	◎	◎	◎	◎	従来例1
実施例2	◎	◎	○	◎	◎	従来例1
実施例3	○	○	◎	◎	◎	従来例1
実施例4	◎	◎	○	◎	◎	従来例1
実施例5	◎	◎	◎	◎	◎	従来例1
実施例6	◎	◎	◎	◎	◎	従来例1
比較例1	Δ	×	◎	◎	○	従来例1
比較例2	–	–	–	–	–	従来例1
比較例3	◎	◎	Δ	◎	◎	従来例1
比較例4	Δ	×	×	◎	Δ	従来例1
従来例1	–	–	–	–	–	–
従来例2	Δ	Δ	○	×	Δ	従来例1

◎：良好、○：同等、Δ：やや劣る、×：劣る

[0047]

[Effect of the Invention] As explained in full detail above, this invention is the made thing which paid its attention to the above conventional troubles. As fiber which constitutes a nonwoven fabric original fabric, high-melting polyester staple fiber and thermal melting arrival nature polyester system binder fiber are included. Moreover, it consists of a nonwoven fabric of a configuration of coming to carry out the laminating of the design

layer from which configuration fiber combination differs, and the base material layer. Since it comes to give a surface design to one [at least] front face for example, by needle punching etc., while unifying and having simulataneously the support function of a base material layer, and a buffer function and the aesthetic function of epidermis Furthermore, as illustrated in the above-mentioned example, the interior material which consists of a nonwoven fabric of the single structure which combined flexible tactile feeling and outstanding sound absorbing and insulating properties is offered. Moreover, after heating at the temperature between these melting points using a melting point difference low-melt point points, such as copoly ester, and high-melting [, such as gay polyester,], it is the bulky nonwoven fabric which can be fabricated by supplying to a press machine and cooling, and since heating and shaping can be performed at one process, the marked effectiveness that lightweight-ization of a product can also be further attained with the cost reduction accompanying simplification of a production process is done so.

[Translation done.]

(19)日本国特許庁（ＪＰ）　(12)公開特許公報（Ａ）　(11)特許出願公開番号

特開平10－147191

(43)公開日　平成10年(1998)６月２日

(51)Int.Cl.*	識別記号	Ｆ１	
Ｂ６０Ｒ　13/08		Ｂ６０Ｒ　13/08	
Ｂ３２Ｂ　5/26		Ｂ３２Ｂ　5/26	
Ｄ０４Ｈ　1/54		Ｄ０４Ｈ　1/54	Ｑ
11/08		11/08	
Ｅ０４Ｂ　1/84		Ｅ０４Ｂ　1/84	

審査請求　未請求　請求項の数17　ＯＬ　（全 10 頁）

(21)出願番号　特願平8－309275

(22)出願日　平成８年(1996)11月20日

(71)出願人　000000952
鐘紡株式会社
東京都墨田区墨田五丁目17番４号

(71)出願人　000003997
日産自動車株式会社
神奈川県横浜市神奈川区宝町２番地

(72)発明者　奥　章祐
大阪府大阪市住之江区南港中５－５－32－808

(72)発明者　永山　啓樹
神奈川県横浜市神奈川区宝町２番地　日産自動車株式会社内

(74)代理人　弁理士　杉村　暁秀　（外６名）

最終頁に続く

(54)【発明の名称】　自動車内装用嵩高起毛不織布及びその製造法

(57)【要約】
高融点のポリエステルステープル繊維と熱融着性ポリエステル系バインダー繊維を含み、構成繊維配合が異なる意匠層と基材層とを積層一体化してなる不織布からなり、意匠層の表面にニードルパンチング等によってパイルを形成し表面意匠を施してなる自動車内装用嵩高起毛不織布。

【課題】　基材の支持機能及び緩衝機能と表皮の審美的機能とを一体化して併有し、更には、柔軟な触感と優れた吸遮音性と改善された耐摩耗性とを兼備した不織布よりなる自動車内装材を提供する。

【解決手段】　平均の厚みが１～５０ｍｍであり且つ平均の見かけ密度が０．０１～１．０ｇ／ｃｍ^3 であり、表面に着色繊維パイルを有する意匠層と支持機能及び緩衝機能を有する不織布基材とからなり、全体が高融点合成繊維ステープルと、低融点バインダー繊維よりなる嵩高起毛不織布積層体。

【特許請求の範囲】

【請求項1】　少なくとも一方の表面を含む構成繊維が着色され且つその表面全面に亙って構成繊維の一部が突出したパイルを形成してなる不織布意匠層と、該意匠層と一体的に積層され保形性増強及び緩衝機能を有する不織布基材層とを含み、全体として熱可塑性合成繊維の短繊維からなり、更に該短繊維がマトリックス繊維及び熱融着性バインダー繊維を含んでなる不織布であって、上記意匠層は2～30デニールの高融点マトリックス繊維98～76重量%と、少なくとも繊維表面を低融点合成重合体が占める1～20デニールの熱融着性バインダー繊維2～24重量%とをブレンドしてなり、該意匠層と一体的に積層された上記基材層は1．5～40デニールの高融点マトリックス繊維95～30重量%と、少なくとも繊維表面を低融点合成重合体が占める1～20デニールの熱融着性バインダー繊維5～70重量%をブレンドして構成されることにより、前記マトリックス繊維の融点と前記バインダー繊維の融点の間の温度で加熱されることにより構成繊維の交点に形成された融着点が実質的に均一に分布してなり優れた吸遮音性を有することを特徴とする自動車内装用嵩高起毛不織布嵩高起毛不織布。

【請求項2】　意匠層に配合される熱融着性バインダー繊維が2～15デニールの繊度を有する請求項1記載の自動車内装用嵩高起毛不織布。

【請求項3】　意匠層が高融点マトリックス繊維95～80重量%と熱融着性バインダー繊維5～20重量%とをブレンドしてなる請求項1または2記載の自動車内装用嵩高起毛不織布。

【請求項4】　基材層が高融点マトリックス繊維90～40重量%と熱融着性バインダー繊維10～60重量%とをブレンドしてなる請求項1～3の何れか1項に記載の自動車内装用嵩高起毛不織布。

【請求項5】　前記熱可塑性合成繊維がポリエステル系繊維である請求項1～4の何れか1項に記載の自動車内装用嵩高起毛不織布。

【請求項6】　前記高融点マトリックス繊維が実質的にホモポリエステル繊維である請求項1～5の何れか1項に記載の自動車内装用嵩高起毛不織布。

【請求項7】　前記熱融着性バインダー繊維の少なくとも繊維表面を占める低融点合成重合体が低融点のコポリエステルまたはブレンドポリエステルである請求項1～6の何れか1項に記載の自動車内装用嵩高起毛不織布。

【請求項8】　前記熱融着性バインダー繊維が低融点のコポリエステルまたはブレンドポリエステルを鞘成分とし、ホモポリエステルを芯成分とする芯鞘型コンジュゲート繊維である請求項7に記載の自動車内装用嵩高起毛不織布。

【請求項9】　前記低融点コポリエステルが100～230℃の範囲の融点を有する請求項8の自動車内装用嵩高起毛不織布。

【請求項10】　前記低融点コポリエステルが105～210℃の範囲の融点を有する請求項9の積層された自動車内装用嵩高起毛不織布。

【請求項11】　前記不織布が積層された状態において、成形後1～50mmの平均厚みを有し、平均見かけ密度0．01～1．0g／cm^{3}に成形した繊維集合体からなることを特徴とする請求項1～10の何れか1項に記載の自動車内装用嵩高起毛不織布。

【請求項12】　前記不織布が積層された状態において、5～70mmの厚みと300～2000g／cm^{2}の目付を有する請求項1～11の何れか1項に記載の自動車内装用嵩高起毛不織布。

【請求項13】　着色された熱可塑性合成繊維よりなる意匠層用短繊維のパイルがニードルパンチにより表面に形成され、更にシャーリング加工にてその先端部分を切り揃えたものである請求項1～12の何れか1項に記載の自動車内装用嵩高起毛不織布。

【請求項14】　前記パイル先端部がシャーリング加工によって所定の高低差を以て切り揃えられ、コード調またはディロア調等に柄出しされてなる請求項13の自動車内装用嵩高起毛不織布。

【請求項15】　一部突出したパイルを有する着色された熱可塑性合成繊維よりなる意匠層用不織布と、それとは別体に作成された保形性増強及び緩衝機能を有する不織布基材層とを積層し、両者をニードルパンチ及び／又は加熱接着することにより接合一体化することを特徴とする自動車内装用嵩高起毛不織布の製造方法。

【請求項16】　複数のクロスレイヤーを連続的に用い、最外層ウエブ供給用を含む少なくとも1台のクロスレイヤーから着色された意匠層用短繊維ウェブを供給し、それぞれが積層化した後に意匠層用短繊維ウェブのパイルをニードルパンチにより表面に形成し、更にシャーリング加工にてその先端部分を切り揃え、意匠層部分と基材層部分を一体化したものを供給することを特徴とする自動車内装用嵩高起毛不織布の製造方法。

【請求項17】　マトリックス繊維として2～30デニールの高融点ポリエステル系着色ステープル繊維98～76重量%と、熱融着性バインダー繊維として、低融点コポリエステルが繊維表面の少なくとも一部を占めるコンジュゲート構造を有する1～20デニールのポリエステル系熱融着性着色ステープル繊維2～24重量%とをブレンド後カーディングして意匠層用の着色短繊維ウェブとなし、別途マトリックス繊維として平均繊度1．5～40デニールの高融点ポリエステル系ステープル繊維95～30重量%と、熱融着性バインダー繊維として低融点コポリエステルが繊維表面の少なくとも一部を占めるポリエステル系コンジュゲート構造を有する平均繊度1～20デニールの熱融着性ステープル繊維5～70重量%とをブレンド後カーディングして基材層用短繊維ウ

ェブとなし、次いで上記意匠層用短繊維ウェブと基材層用短繊維ウェブとを連続した複数のクロスレイヤーに仕掛け、最外層ウェブ供給用を含む少なくとも1台のクロスレイヤーから着色された意匠層用短繊維ウェブを供給してウェブ積層体を形成し、その後全体をニードルパンチングにより一体化し、更に、フォークニードル等を用い、表面にパイルを形成し、パイル部分の先端部分をシャーリング加工して切り揃え、必要に応じてヒートセットをすることを特徴とする自動車内装用嵩高起毛不織布の製造方法。

【発明の詳細な説明】

【0001】

【発明の属する分野】本発明は、天井、壁、床（カーペット）等、居住空間の仕切り面、特に自動車の内装に用いられる嵩高起毛不織布に関する。

【0002】

【従来の技術】従来、天井、壁、床（カーペット）等、居住空間の仕切り面、或いは自動車の内装材としては、図1～3に示すような垂直断面形状を有する不織布が知られている。図1に示すものは、特開平4－303367号公報に開示されたように、形状安定感を得るために比較的硬めの基材2に不織布表皮2を張り付けた例である。この場合、基材2としては、鋼板、コンクリート、木質ボード、樹脂ボード、段ボール、レジンフェルト等が用いられる。これらの基材上に不織布表皮1を接着または積層することにより内装材としての美観を確保することができる。

【0003】図2に示すものは、基材と表皮3との間に柔らかくクッション性を有するポリウレタンやポリエチレン等の発泡体シートやフェルトを基材（支持体）4として用いることにより触感や吸遮音性を改善した例である。例えば、特開昭61－237630号、特開平2－162171号、同3－176241号、同4－176742号等の各公報に開示されている。

【0004】また、図3は基材として成形可能な不織布6に不織布表皮5を張り付けて、触感、吸遮音性を改善した例であり、特開平5－30681号、同5－118217号として提案されている。

【0005】しかしながら、図1の場合、硬い基材2に不織布表皮1を張り付けても、なお触感は硬く、高級感を損なうという問題点がある。また、内装材に吸遮音性が要求される場合、基材2が硬いと、通気性が全くないかまたは極めて小さい状態となり、十分な吸遮音性が得られないという問題点もある。

【0006】図2の場合は、触感や吸遮音性は改善されるが、構成が複雑となり材料コストや製造コストの上昇を招くことになり好ましくない。

【0007】図3の場合は、触感、吸遮音性は改善されるが、表皮5、基材6に同じ不織布を用いながら、それぞれ別個に製造したものを再び張り付ける工程を必要とする等、工数の増加によるコスト上昇の問題点がある。

【0008】

【発明が解決しようとする課題】本発明は、このような従来の問題点に着目してなされたもので、少なくとも一方の表面に例えばニードルパンチ等によって表面意匠を施し、基材層の支持機能及び緩衝機能と表皮の審美的機能とを一体化して併有するとともに、更に、柔軟な触感と優れた吸遮音性とを兼備した単一構造の不織布よりなる内装材を提供し、上記問題点を解決することを目的とする。

【0009】

【課題を解決するための手段】本発明の内装材用嵩高起毛不織布は、少なくとも一方の表面を含む構成繊維が着色されて不織布意匠層を構成するとともに、該意匠層と一体的に積層された保形性増強機能及び緩衝機能を持つ不織布基材層を含んでなり、更に表面全面に亙って着色された該不織布の構成繊維の一部が突出したパイルを形成し、意匠模様を顕出してなる。また、本発明の内装材用嵩高起毛不織布は、全体として熱可塑性合成繊維の短繊維からなり、最も好ましくは高融点ポリエステル繊維のマトリックス繊維及び熱融着性バインダー繊維を特定の配合比率でブレンドしてなり、構成繊維の交点がバインダー繊維によって接着され、接着点が不織布全体に実質的に均一に分布してなる形態の安定した吸遮音性不織布で構成される。

【0010】本発明の内装用嵩高起毛不織布の製造法は、高融点合成繊維ステープルからなるマトリックス繊維及び熱融着性バインダー繊維ステープルをそれぞれ特定の配合比率でブレンド及びカーディングして、意匠層と基材層用ウェブとを別体に作製し、両者を積層してニードルパンチ及び／又は加熱接着にて成型一体化し、次いで、フォークニードル等を用い、表面にパイルを形成し、パイル部分の先端部分をシャーリング加工により切り揃え、好ましくは、適宜所定の高低差を以て切り揃えコード調やディロア調の柄を出し、必要に応じてヒートセットをすることよりなる。

【0011】

【発明の実施の形態】上記不織布意匠層の構成繊維配合は、マトリックス繊維として2～30デニールの高融点ポリエステル系ステープル繊維76～98重量%と、熱融着性バインダー繊維として、低融点コポリエステルが繊維表面の少なくとも一部を占めるコンジュゲート構造を有する1～20デニールのポリエステル系熱融着性ステープル繊維2～24重量%とをブレンドしてなる。

【0012】上記熱融着性バインダー繊維は、不織布構成繊維との交点の少なくとも一部を熱融着により接合し、所定形状に成形された不織布意匠層を安定化する。該バインダー繊維は不織布意匠層重量基準で2～24重量%、好ましくは5～20重量%配合されるが、2重量%未満では、繊維間接着点が少なくなるため、使用中に

パイル部からの毛抜けが頻繁に発生する他、加熱成形による十分な形状保持性を得難いため好ましくなく、一方２４重量％を超えるとコストアップを招く他に、繊維間接着点が増えるため、不織布意匠層の一方の面に形成されたコード調、ディロア調等の柄が加熱成形後に変化し、また、成形加熱後、毛倒れ等が生じる虞れがあり、見栄え上問題が生じる可能性がある。更に意匠層のバインダー繊維を５～２０重量％の範囲に限定すれば、上記の懸念はすべて解消し、パイルの毛抜けが完全に防止され、成形加熱後の毛倒れ発生の恐れもなく良好な形態安定性が得られる。

【００１３】又、該意匠層に用いる熱融着性ポリエステル系コンジュゲート繊維の繊度は１～２０デニールの範囲にあるが、更に好ましくは、２～１５デニールである。１デニール未満では、原糸製造コストが上昇する上に、不織布化工程におけるカード通過性に問題が生じ、品質の良好な不織布が得難くなり、又、２０デニールを超えると繊維本数の減少に伴って繊維間接着点も減少し、加熱成形により十分な形状保持性性得られ難くなるため好ましくない。更に、上記繊度を２～１５デニールの範囲に限定すれば、高価なコンジュゲート繊維のコストダウンに寄与する他、品質並びに形態安定性の一層改良された意匠層が得られる。又、上記意匠層を構成する高融点ポリエステルマトリックス繊維の繊度が２デニール未満になると、上記同様に不織布化工程におけるカード通過性に問題が生じ、品質の良好な不織布原反が得難くなり、一方３０デニールを超えるとパイルの肌理が粗くなり、粗硬感が増大するなど、風合いの面で好ましくない。

【００１４】原反に所定の色を着色するために上記ポリエステルの双方又はいずれか一方を、紡糸段階で紡糸原料に顔料を添加して着色する所謂、原着繊維とすることが好ましく、また、耐光剤等を添加することも可能である。

【００１５】更に、該意匠層と一体的に積層され保形性増強機能および緩衝機能を有する不織布基材層は、マトリックス繊維としての高融点ポリエステル繊維とバインダー繊維としての熱融着性ポリエステル繊維をブレンドして用いるが、不織布基材層の構成繊維配合は、マトリックス繊維として、平均繊度１．５～４０デニールの高融点ポリエステル系ステープル繊維を不織布基材の重量基準で３０～９５重量％と、熱融着性バインダー繊維として低融点コポリエステルが繊維表面の少なくとも一部を占めるポリエステル系コンジュゲート構造を有する平均繊度１～２０デニールの熱融着性ステープル繊維を不織布基材の重量基準で５～７０重量％とをブレンドしてなる。

【００１６】上記不織布基材層を構成する高融点ポリエステル系ステープル繊維の平均繊度が１．５デニール未満の場合には、繊維自体の剛性が小さいため、芯材としての保形性増強並びに緩衝機能が不足し、更に紡糸速度の低下により製造コストが上昇し、又は不織布化する際のカード機の通過性が低下して、品質の良い不織布基材を安価に得ることができない。一方、４０デニールを超えると繊維集合体中の単位体積当たりの繊維総本数が少なくなり、バインダー繊維との接着点が減少して、十分な剛性を得ることが困難となる。また、繊維径が太くなることにより、表面積／横断面積の値が小さくなるため、効率よく音のエネルギーを吸収し難くなる。

【００１７】上記不織布基材層を構成する熱融着性ポリエステル系バインダー繊維は、当該不織布層の重量基準で５～７０重量％、好ましくは１０～６０重量％配合する。５重量％未満では、繊維間接着点が少なくなるため、加熱成形をした際、十分な形状保持性が得られ難いため好ましくなく、一方、７０重量％を超えると、コストアップを招く他、繊維間接着点が増えるために圧縮反発力が過大となり、適度な緩衝機能を発揮し難くなる可能性がある。更に、上記配合量を１０～６０重量％の範囲に限定することにより、最も適度な数の接着点が得られ、優れた形態安定性と緩衝機能とを備えた基材層が合理的コストで提供される。

【００１８】本発明に用いる高融点ポリエステル繊維とは、繊維形成性熱可塑性芳香族ポリエステルを主たる構成成分とする繊維であり、特にポリエチレンテレフタレート系繊維、ポリブチレンテレフタレート系繊維、ポリエチレンナフタレート系繊維、ポリ（ｐ－オキシベンゾエート）系繊維、ポリ［ｐ－（２－ヒドロキシエチル）オキシベンゾエート］系繊維等を例示することができる。そのうち、特に入手容易なポリエチレンテレフタレート繊維は、融点や引張強度、モジュラスが比較的高くマトリックス繊維として用いた場合、保形性増強および緩衝機能を有効に果たすので好ましい。更に、ホモポリエステルと共重合ポリエステル或いは変性ポリエステルとを繊維軸に沿って偏心的、例えば、偏心芯鞘型或いはサイド・バイ・サイド型、に複合したコンジュゲート繊維は熱処理により捲縮を発現し不織布の交絡度を高め成形性が増す特色がある。更に、上記高融点ポリエステル繊維の横断面形状としては、円形の他、偏平型、Ｙ型、中空型等、特に制限はない。

【００１９】又、バインダー繊維に用いられる低融点コポリエステルとしては、通常、コポリマー或いはブレンドポリマー、典型的には、ポリエチレンテレフタレートにイソフタル酸等の共単量体を共重合或いはブレンドすることによって融点を低下させたポリエステル系熱融着性ポリマーが好適に使用される。一般的には、例えば、テレフタル酸、イソフタル酸、アジピン酸等の二塩基酸成分と、例えば、エチレングリコール、プロピレングリコール、ジエチレングリコール、トリエチレングリコール、ポリエチレングリコール、ポリプロピレングリコール等のジオール成分、またはラクトンを開環して共重合

したコポリエステル等を用いることが可能である。支持機能を有するホモポリエステルとしては、特に限定はないが、ポリエチレンテレフタレートまたはそれに準ずる成分を有するポリエスエルが安価で最も好ましい。

【００２０】更に又、バインダー繊維は上記の熱融着性ポリマーよりなる単一成分繊維でもよいが、かかる熱融着性ポリマーが繊維表面の少なくとも一部を占めるコンジュゲート繊維、特に、ホモポリマーを芯成分とし熱融着性共重合ポリマーを鞘成分とする芯鞘型コンジュゲート繊維を用いれば、芯成分の支持機能を維持したまま熱融着機能を果たすことができるので最も好適である。また、サイド・バイ・サイド型コンジュゲート繊維とすれば、過度に減少した融着点の形成により不織布の硬化を防ぐこともできる。

【００２１】バインダー繊維は熱処理、例えば高融点ポリエステルよりなるマトリックス繊維の軟化点以下の温度による熱処理で軟化或いは溶融して融着性を発現することができる。熱処理はマトリックス繊維の軟化点温度未満、バインダー繊維の融着性発現温度以上で行われるが、単独の工程としても或いは加熱成形工程に伴って行うこともできる。かかる熱処理により、バインダー繊維と交わる構成繊維は交点において接着し不織布に形態安定性を付与する他、バインダー繊維はマトリックス繊維の支持機能と協働して不織布に適度な剛性を与える。更にまた、バインダー繊維の使用により、不織布の面に添設される凹凸形状を吸収したり、意図的に凹凸を不織布表面に安定に付与することも可能となる。

【００２２】低融点コポリエステルの融点は１００～２３０℃の範囲であることが好ましく、更に好ましくは１０５～２１０℃の範囲である。融点が１００℃未満では、紡糸の際に単糸間融着によりタッキングが起こる問題があるほか、マルチフィラメント間の融着によって解繊が困難になるという問題点がある。融点が２３０℃を越えると、加熱時に低融点成分だけでなく高融点成分も軟化または溶融する可能性があり、塊状となって繊維としての形状を失い、見栄え上問題となる場合があるほか、加熱温度が上昇し成形が困難になる。上記融点が１０５～２１０℃の範囲にある低融点コポリエステルを用いることにより、上記の問題点を完全に解消することが可能である。

【００２３】本発明の内装用嵩高起毛不織布を成形した後の平均厚みは１～５０mmであることが好ましい。１mm未満の場合には、厚み不足による曲げ剛性低下傾向が否めず強度的にも弱くなり、また剛性を確保できた場合においても所望の適度な通気量が得られず、内装材に吸音もしくは遮音等の性能を付与することが困難になってしまう。更に成型時に作用する圧力等により、表面の風合い、見栄えを損なう虞れもある。一方、５０mmを越えると、低密度の場合、芯材自体の単位断面積当りの曲げ弾性率が小さくなるため、また高密度の場合、芯材の自重が大きくなるため、自重による変形、垂れ下り、へたり等がみられ保形性能が低下する。

【００２４】また、本発明の内装用嵩高起毛不織布は積層された状態において、成型前における厚みが５～７０mmであり、３００～２０００g／m² の面密度（目付）を有することが好ましい。厚みが５mm未満の場合、所望の面密度を確保することが困難であり、一方、７０mmを越えると、原反の厚みが大きすぎるため、成型時のハンドリング等の作業性が低下する。また、面密度が３００g／m² 未満の場合、圧縮反発力の不足により、緩衝層としての機能を十分に発揮することができず、また、２０００g／m² を超えると、繊維集合体が硬過ぎて、成型後、表面が所望の風合いを備えなくなる。

【００２５】本発明の内装用嵩高起毛不織布の製造法は、意匠層として、原着、染色、捺染等、好ましくは原着によって着色された熱可塑性合成繊維よりなる短繊維ウェブと、それとは別体に作製された上記と同種の着色または非着色熱可塑性合成繊維よりなる保形性増強及び緩衝層用の短繊維ウェブとを積層し、両者をニードルパンチ及び／又は加熱接着にて成型一体化し、次いで、フォークニードル等を用い、表面にパイルを形成し、パイル部分の先端部分をシャーリング加工により切り揃え、好ましくは、適宜所定の高低差を以て切り揃えコード調やディロア調に柄出しする。

【００２６】また、上記製造法の好適な具体例は、マトリックス繊維として２～３０デニールの高融点ポリエステル系ステープル繊維７６～９８重量％と、熱融着性バインダー繊維として、低融点コポリエステルが繊維表面の少なくとも一部を占めるコンジュゲート構造を有する１～２０デニールのポリエステル系熱融着性ステープル繊維２～２４重量％とをブレンドし、定法によりカーディングして不織布意匠層用の短繊維ウェブを作製し、別途マトリックス繊維として平均繊度１．５～４０デニールの高融点ポリエステル系ステープル繊維３０～９５重量％と、熱融着性バインダー繊維として低融点コポリエステルが繊維表面の少なくとも一部を占めるポリエステル系コンジュゲート構造を有する平均繊度１～２０デニールの熱融着性ステープル繊維５～７０重量％とをブレンドし、定法によりカーディングして不織布基材層用の短繊維ウェブを作製する。意匠層用の短繊維ウェブは、例えば、原着繊維を以て構成する等して着色されていることが良い。次いで、これらの短繊維ウェブを連続した複数のクロスレイヤーに仕掛け、最外層ウェブ供給用を含む少なくとも１台のクロスレイヤーから着色された意匠層用短繊維ウェブを供給してウェブ積層体となし、その後全体をニードルパンチングにより一体化し、更に、フォークニードル等を用い、表面にパイルを形成し、パイル部分の先端部分をシャーリング加工して切り揃え、必要に応じてヒートセットをする。この方法は連続工程

による量産を可能とする。

【0027】このように積層一体化された嵩高起毛不織布は、前記高融点ポリエステルの融点と低融点コポリエステルの融点の間の温度で加熱することにより一工程で成形が可能である。かかる内装材用嵩高起毛不織布は、改善されたクッション性と、高級感を伴う柔軟な触感とを備え、更に優れた吸遮音性能を有する。

【0028】

【実施例】以下、本発明の実施例をその効果と共に示す。実施例、比較例及び従来例における各特性値の測定法は下記の方法によった。

【0029】測定方法1

（吸音性測定）実施例、比較例及び従来例の方法によって得られた自動車用内装材をＪＩＳＡ１４０５「管内法による建築材料の垂直入射吸音率測定法」に基づいて吸音率を測定し、吸音性を評価した。サンプルサイズφ１００mm、測定範囲１２５～１６００Ｈｚ。

【0030】（摩耗試験）実施例、比較例及び従来例の方法によって得られた自動車用内装材をＪＩＳＫ７２０４「摩耗輪によるプラスチックの摩耗試験方法」に基づいて摩耗性能を測定し、摩耗性を評価した。荷重２５０ｇｆ、試験回数１００回転。

【0031】（実施例１）不織布の配合としては、意匠層は、グレーに原着した１０デニール５１mm長の円形断面の通常ポリエチレンテレフタレートステープル繊維：９０重量%、同様にグレーに原着した４デニール５１mm長の芯鞘構造を有する熱融着性ポリエステル系ステープル繊維（１１０℃溶融タイプ）：１０重量%、目付４００ｇ／m² とした。更に、基材層の繊維配合は１３デニール５１mm長の円形断面の通常ポリエチレンテレフタレートステープル繊維：９５重量%、２デニール５１mm長の芯鞘構造を有する熱融着性ポリエステル系ステープル繊維（１７０℃溶融タイプ）：５重量%、目付６００ｇ／m² とした。次にこれらの繊維をそれぞれブレンド、カーディング、クロスレイヤー、ニードルパンチング工程を経て、意匠層と基材層を連続的に積層し、不織布原反を得た。更に得られた原反の意匠層にフォークニードルを貫通させパイル部を形成した後、シャーリング処理してディロア調の柄出しを行い厚み４０mmの嵩高起毛不織布を得た。得られた起毛積層不織布原反を１８０℃に加熱し、成形型の装着されたプレス機に投入し成形体を得た。成形後の形状保持性は良好で、テーバー摩耗試験結果も良好であり、ディロア調の風合いも保たれ、色調も所望のものが得られた。

【0032】（実施例２）不織布の配合としては、意匠層は、グレーに原着した２デニール５１mm長の円形断面の通常ポリエチレンテレフタレートステープル繊維：９５重量%、同様にグレーに原着した２デニール５１mm長の芯鞘構造を有する熱融着性ポリエステル系ステープル繊維（１１０℃溶融タイプ）：５重量%、目付２００ｇ／m²とした。更に、基材層の繊維配合は６デニール５１mm長の円形断面の通常ポリエチレンテレフタレートステープル繊維：８５重量%、１．５デニール５１mm長の芯鞘構造を有する熱融着性ポリエステル系ステープル繊維（１１０℃溶融タイプ）：１５重量%、目付１００ｇ／m² とした。次にこれらの繊維をそれぞれブレンド、カーディング、クロスレイヤー、ニードルパンチング工程を経て、意匠層と基材層を連続的に積層し、不織布原反を得た。更に得られた原反の意匠層にフォークニードルを貫通させパイル部を形成した後、シャーリング処理してディロア調の柄出しを行い厚み７mmの嵩高起毛不織布を得た。得られた起毛積層不織布原反を１５０℃に加熱し、成形型の装着されたプレス機に投入し成形体を得た。成形後の形状保持性は良好で、テーバー摩耗試験結果も良好であり、ディロア調の風合いも保たれ、色調も所望のものが得られた。

【0033】（実施例３）不織布の配合としては、意匠層は、グレーに原着した２０デニール５１mm長の円形断面の通常ポリエチレンテレフタレートステープル繊維：８０重量%、同様にグレーに原着した１５デニール５１mm長の芯鞘構造を有する熱融着性ポリエステル系ステープル繊維（１１０℃溶融タイプ）：２０重量%、目付５００ｇ／m² とした。更に、基材層の繊維配合は２デニール５１mm長の円形断面の通常ポリエチレンテレフタレートステープル繊維：８０重量%、６デニール５１mm長の芯鞘構造を有する熱融着性ポリエステル系ステープル繊維（２００℃溶融タイプ）：２０重量%、目付１５００ｇ／m² とした。次にこれらの繊維をそれぞれブレンド、カーディング、クロスレイヤー、ニードルパンチング工程を経て、意匠層と基材層を連続的に積層し、不織布原反を得た。更に得られた原反の意匠層にフォークニードルを貫通させパイル部を形成した後、シャーリング処理してディロア調の柄出しを行い厚み７０mmの嵩高起毛不織布を得た。得られた起毛積層不織布原反を２１０℃に加熱し、成形型の装着されたプレス機に投入し成形体を得た。成形後の形状保持性は良好で、テーバー摩耗試験結果も良好であり、ディロア調の風合いも保たれ、色調も所望のものが得られた。

【0034】（実施例４）不織布の配合としては、意匠層は、グレーに原着した１３デニール５１mm長の円形断面の通常ポリエチレンテレフタレートステープル繊維：７６重量%、同様にグレーに原着した１０デニール５１mm長の芯鞘構造を有する熱融着性ポリエステル系ステープル繊維（１１０℃溶融タイプ）：２４重量%、目付４００ｇ／m² とした。更に、基材層の繊維配合は４０デニール５１mm長の円形断面の通常ポリエチレンテレフタレートステープル繊維：３０重量%、２０デニール５１mm長の芯鞘構造を有する熱融着性ポリエステル系ステープル繊維（１７０℃溶融タイプ）：７０重量%、目付６００ｇ／m² とした。次にこれらの繊維をそ

れぞれブレンド、カーディング、クロスレイヤー、ニードルパンチング工程を経て、意匠層と基材層を連続的に積層し、不織布原反を得た。更に得られた原反の意匠層にフォークニードルを貫通させパイル部を形成した後、シャーリング処理してディロア調の柄出しを行い厚み５０ｍｍの嵩高起毛不織布を得た。得られた起毛積層不織布原反を１８０℃に加熱し、成形型の装着されたプレス機に投入し成形体を得た。成形後の形状保持性は良好で、テーバー摩耗試験結果も良好であり、ディロア調の風合いも保たれ、色調も所望のものが得られた。

【００３５】（実施例５）不織布の配合としては、意匠層は、グレーに原着した１０デニール５１ｍｍ長の円形断面の通常ポリエチレンテレフタレートステープル繊維：８５重量％、同様にグレーに原着した４デニール５１ｍｍ長の芯鞘構造を有する熱融着性ポリエステル系ステープル繊維（１１０℃溶融タイプ）：１５重量％、目付３２０／m^2 とした。更に、基材層の繊維配合は１３デニール５１ｍｍ長の円形断面の通常ポリエチレンテレフタレートステープル繊維：９０重量％、２デニール５１ｍｍ長の芯鞘構造を有する熱融着性ポリエステル系ステープル繊維（１７０℃溶融タイプ）：１０重量％、目付１０５０ｇ／m^2 とした。次にこれらの繊維をそれぞれブレンド、カーディング、クロスレイヤー、ニードルパンチング工程を経て、意匠層と基材層を連続的に積層し、不織布原反を得た。更に得られた原反の意匠層にフォークニードルを貫通させパイル部を形成した後、シャーリング処理してディロア調の柄出しを行い厚み４０ｍｍの嵩高起毛不織布を得た。得られた起毛積層不織布原反を１８０℃に加熱し、成形型の装着されたプレス機に投入し成形体を得た。成形後の形状保持性は良好で、テーバー摩耗試験結果も良好であり、ディロア調の風合いも保たれ、色調も所望のものが得られた。

【００３６】（実施例６）不織布の配合としては、意匠層は、グレーに原着した１０デニール５１ｍｍ長の円形断面の通常ポリエチレンテレフタレートステープル繊維：８５重量％、同様にグレーに原着した４デニール５１ｍｍ長の芯鞘構造を有する熱融着性ポリエステル系ステープル繊維（１１０℃溶融タイプ）：１５重量％、目付３２０ｇ／m^2 とした。更に、基材層の繊維配合は１３デニール５１ｍｍ長の円形断面の通常ポリエチレンテレフタレートステープル繊維：９０重量％、２デニール５１ｍｍ長の芯鞘構造を有する熱融着性ポリエステル系ステープル繊維（１７０℃溶融タイプ）：１０重量％、目付１０５０ｇ／m^2 とした。次に意匠層のみ繊維をブレンド、カーディング、クロスレイヤー、ニードルパンチング工程を経て、基材層とは別体で作製し、次に基材層の繊維をブレンド、カーディング、クロスレイヤーを連続的に行い、更にその上に、別体で作製しておいた上記意匠層を積層し、全体をニードルパンチングにより一体化した厚み４０ｍｍの不織布原反を得た。得られた起毛積層不織布原反を１８０℃に加熱し、成形型の装着されたプレス機に投入し成形体を得た。成形後の形状保持性は良好で、テーバー摩耗試験結果も良好であり、ディロア調の風合いも保たれ、色調も所望のものが得られた。

【００３７】（比較例１）不織布の配合としては、意匠層は、グレーに原着した４０デニール５１ｍｍ長の円形断面の通常ポリエチレンテレフタレートステープル繊維：７５重量％、同様にグレーに原着した３０デニール５１ｍｍ長の芯鞘構造を有する熱融着性ポリエステル系ステープル繊維（１１０℃溶融タイプ）：２５重量％、目付３００ｇ／m^2 とした。更に、基材層の繊維配合は１３デニール５１ｍｍ長の円形断面の通常ポリエチレンテレフタレートステープル繊維：９０重量％、２デニール５１ｍｍ長の芯鞘構造を有する熱融着性ポリエステル系ステープル繊維（１７０℃溶融タイプ）：１０重量％、目付１０００ｇ／m^2 とした。次にこれらの繊維をそれぞれブレンド、カーディング、クロスレイヤー、ニードルパンチング工程を経て、意匠層と基材層を連続的に積層し、不織布原反を得た。更に得られた原反の意匠層にフォークニードルを貫通させパイル部を形成した後、シャーリング処理してディロア調の柄出しを行い厚み５０ｍｍの嵩高起毛不織布を得た。得られた起毛積層不織布原反を１８０℃に加熱し、成形型の装着されたプレス機に投入し成形体を得た。成形後の形状保持性は良好であるが、意匠層の繊維径が大きいため、所望の見栄え、触感が得られなかった。

【００３８】（比較例２）不織布の配合としては、意匠層は、グレーに原着した１０デニール５１ｍｍ長の円形断面の通常ポリエチレンテレフタレートステープル繊維：９０重量％、同様にグレーに原着した４デニール５１ｍｍ長の芯鞘構造を有する熱融着性ポリエステル系ステープル繊維（１１０℃溶融タイプ）：１０重量％、目付３００ｇ／m^2 とした。更に、基材層の繊維配合は１３デニール５１ｍｍ長の円形断面の通常ポリエチレンテレフタレートステープル繊維：９７重量％、２デニール５１ｍｍ長の芯鞘構造を有する熱融着性ポリエステル系ステープル繊維（２３０℃溶融タイプ）：３重量％、目付５００ｇ／m^2 とした。次にこれらの繊維をそれぞれブレンド、カーディング、クロスレイヤー、ニードルパンチング工程を経て、意匠層と基材層を連続的に積層し、不織布原反を得た。更に得られた原反の意匠層にフォークニードルを貫通させパイル部を形成した後、シャーリング処理してディロア調の柄出しを行い嵩高の起毛不織布を得た。得られた起毛積層不織布原反を２５０℃に加熱したが、不織布全体が溶融してしまい、所望の成形体が得られなかった。

【００３９】（比較例３）不織布の配合としては、意匠層は、グレーに原着した１０デニール５１ｍｍ長の円形断面の通常ポリエチレンテレフタレートステープル繊

維：９０重量％、同様にグレーに原着した４デニール５１ｍｍ長の芯鞘構造を有する熱融着性ポリエステル系ステープル繊維（１１０℃溶融タイプ）：１０重量％、目付３００ｇ／ｍ² とした。更に、基材層の繊維配合は６０デニール５１ｍｍ長の円形断面の通常ポリエチレンテレフタレートステープル繊維：８０重量％、２５デニール５１ｍｍ長の芯鞘構造を有する熱融着性ポリエステル系ステープル繊維（１１０℃溶融タイプ）：２０重量％、目付７００ｇ／ｍ² とした。次にこれらの繊維をそれぞれブレンド、カーディング、クロスレイヤー、ニードルパンチング工程を経て、意匠層と基材層を連続的に積層し、不織布原反を得た。更に得られた原反の意匠層にフォークニードルを貫通させパイル部を形成した後、シャーリング処理してディロア調の柄出しを行い厚み５０ｍｍの嵩高起毛不織布を得た。得られた起毛積層不織布原反を１８０℃に加熱し、成形型の装着されたプレス機に投入し成形体を得た。成形後の形状保持性は良好で、テーバー摩耗試験結果も良好であり、ディロア調の風合いも保たれたが、基材層の繊維径が大きいため、所望の吸音性能が得られなかった。

【００４０】（比較例４）不織布の配合としては、意匠層は、グレーに原着した１０デニール５１ｍｍ長の円形断面の通常ポリエチレンテレフタレートステープル繊維：９０重量％、同様にグレーに原着した４デニール５１ｍｍ長の芯鞘構造を有する熱融着性ポリエステル系ステープル繊維（１１０℃溶融タイプ）：１０重量％、目付１５０ｇ／ｍ² とした。更に、基材層の繊維配合は１３デニール５１ｍｍ長の円形断面の通常ポリエチレンテレフタレートステープル繊維：９０重量％、２デニール５１ｍｍ長の芯鞘構造を有する熱融着性ポリエステル系ステープル繊維（１７０℃溶融タイプ）：１０重量％、目付５０ｇ／ｍ² とした。次にこれらの繊維をそれぞれブレンド、カーディング、クロスレイヤー、ニードルパンチング工程を経て、意匠層と基材層を連続的に積層し、不織布原反を得た。更に得られた原反の意匠層にフォークニードルを貫通させパイル部を形成した後、シャーリング処理してディロア調の柄出しを行い厚み５ｍｍの嵩高起毛不織布を得た。得られた起毛積層不織布原反を１８０℃に加熱し、成形型の装着されたプレス機に投入し成形体を得た。成形後の形状保持性は基材層の面密度不足により良好とはいえず、又、表面層の見栄えも面密度不足により良好なものが得られなかった。良好で、テーバー摩耗試験結果も良好であり、ディロア調の風合いも保たれたが、基材層の繊維径が大きいため、所望の吸音性能が得られなかった。

【００４１】（従来例１）原着されたポリエステル繊維を用い、カーディング、クロスレイヤー、ニードルパンチング工程を経て、不織布原反を得た。更に得られた原反にフォークニードルを貫通させパイル部を形成した後、シャーリング処理してディロア調の柄出しを行い、裏面にラテックスをコーティングし、従来用いられているディロアカーペットを得た。フェルト（２５ｍｍ厚、面密度１．２ｋｇ／ｍ² ）を緩衝層とし、ディロアカーペットをプリントされたニードル不織布（厚み３ｍｍ）を表皮とし、１８０℃に加熱し、成形型の装着されたプレス機に投入し成形体を得た。

【００４２】（従来例２）原着されたポリエステル繊維を用い、カーディング、クロスレイヤー、ニードルパンチング工程を経て、不織布原反を得た。更に得られた原反にフォークニードルを貫通させパイル部を形成した後、シャーリング処理してディロア調の柄出しを行い、裏面にラテックスをコーティングし、従来用いられているディロアカーペットを得た。更に緩衝層としてポリエステル不織布を用い、その繊維配合は１３デニール５１ｍｍ長の円形断面の通常ポリエチレンテレフタレートステープル繊維：９０重量％、２デニール５１ｍｍ長の芯鞘構造を有する熱融着性ポリエステル系ステープル繊維（１７０℃溶融タイプ）：１０重量％、目付５００ｇ／ｍ² とした。次にこれらの繊維をそれぞれブレンド、カーディング、クロスレイヤー工程を経て、不織布原反を得た。ディロアカーペットをプリントされたニードル不織布（厚み３ｍｍ）を表皮とし、１８０℃に加熱し、成形型の装着されたプレス機に投入し成形体を得た。

【００４３】上記各実施例、比較例および従来例の嵩高起毛不織布の構造を対比して表１に示す。

【００４４】

【表１】

	意匠層					面密度	基材層					面密度	成形前厚み
	マトリックス繊維		バインダー繊維				マトリックス繊維		バインダー繊維				
	含有量 (wt%)	繊度 (デニール)	含有量 (wt%)	繊度 (デニール)	融点 (℃)	(g/m²)	含有量 (wt%)	繊度 (デニール)	含有量 (wt%)	繊度 (デニール)	融点 (℃)	(g/m²)	(mm)
実施例1	90	10	10	4	110	400	95	13	5	2	170	600	40
実施例2	95	2	5	2	110	200	85	6	15	1.5	110	100	7
実施例3	80	20	20	15	110	500	80	2	20	6	200	1500	70
実施例4	76	13	24	10	110	400	30	40	70	20	170	600	50
実施例5	85	10	15	4	110	320	90	13	10	2	170	1050	40
実施例6	85	10	15	4	110	320	90	13	10	2	170	1050	40
比較例1	75	40	25	30	110	300	90	13	10	2	170	1000	50
比較例2	90	10	10	4	110	300	97	13	3	2	230	500	－
比較例3	90	10	10	4	110	300	80	60	20	25	110	700	50
比較例4	90	10	10	4	110	150	90	13	10	2	170	50	5
従来例1	ポリエステル製ディロアカーペット					300	レジンフェルト					1200	30
従来例2	ポリエステル製ディロアカーペット					300	90	13	10	2	170	500	30

【００４５】また、各実施例、比較例および従来例２で得られた不織布と、従来例１の内装材とについて、それぞれ、見栄え、触感、吸音性、構成の簡便さ、及び耐摩耗性について比較した結果を表２に示す。

【００４６】

【表２】

	見栄え	触感	吸音性	構成の簡便さ	耐摩耗性	比較対象例
実施例1	◎	◎	◎	◎	◎	従来例1
実施例2	◎	◎	○	◎	◎	従来例1
実施例3	○	○	◎	◎	◎	従来例1
実施例4	◎	◎	○	◎	◎	従来例1
実施例5	◎	◎	◎	◎	◎	従来例1
実施例6	◎	◎	◎	◎	◎	従来例1
比較例1	△	×	◎	◎	○	従来例1
比較例2	－	－	－	－	－	従来例1
比較例3	◎	◎	△	◎	◎	従来例1
比較例4	△	×	×	◎	△	従来例1
従来例1	－	－	－	－	－	－
従来例2	△	△	○	×	△	従来例1

◎：良好、○：同等、△：やや劣る、×：劣る

【００４７】

【発明の効果】以上詳述したように、本発明は、前記のような従来の問題点に着目したなされたもので、不織布原反を構成する繊維として、高融点のポリエステルステープル繊維と熱融着性ポリエステル系バインダー繊維を含み、また、構成繊維配合が異なる意匠層と基材層とを積層してなる構成の不織布からなり、少なくとも一方の表面に例えばニードルパンチング等によって表面意匠を施してなるものであるから、基材層の支持機能及び緩衝機能と表皮の審美的機能とを一体化して併有すると共

に、更に、上記実施例で例証されたように、柔軟な触感と優れた吸遮音性とを兼備した単一構造の不織布よりなる内装材を提供する。また、コポリエステル等の低融点とホモポリエステル等の高融点との融点差を利用して、それら融点間の温度で加熱した後、プレス機に投入して冷却することにより成形可能である嵩高不織布であり、加熱・成形を1工程で行い得るため、製造工程の簡略化に伴うコスト低減と、更に製品の軽量化も達成し得るという格段の効果を奏する。

【図面の簡単な説明】

【図1】従来公知の自動車用内装材の1例の構造を示す垂直断面図である。

【図2】従来公知の自動車用内装材の別の例の構造を示す垂直断面図である。

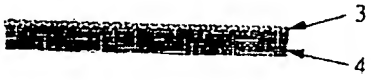
【図3】従来公知の自動車用内装材の更に別の例の構造を示す垂直断面図である。

【符号の説明】

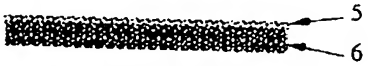
1　ニードル不織布層
2　基材層
3　ニードル不織布層
4　ポリウレタン、フェルト等の緩衝層
5　ニードル不織布層
6　ポリエステル不織布緩衝層

【図1】

【図2】



【図3】



フロントページの続き

(72)発明者　根本　好一
神奈川県横浜市神奈川区宝町2番地　日産自動車株式会社内

(72)発明者　菅原　浩
神奈川県横浜市神奈川区宝町2番地　日産自動車株式会社内